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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,188	07/26/2001	Setho Sing Fee	4713US (00-0975)	7096

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT PAPER NUMBER

2827

DATE MAILED: 01/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,188

Applicant(s)

FEE ET AL.

Examiner

Alonzo Chambliss

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 6-17 and 24-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 18-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 31 December 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The pre-amendment A filed on 12/31/01 has been fully considered and made of in Paper No. 4.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-5 and 18-23, drawn to product, classified in class 257, subclass 700+.
 - II. Claims 6-17 and 24-27, drawn to process, classified in class 438, subclass 106+.

3. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process such as a process without having a second hole being continuous with the first hole and the second hole having a greater diameter than a diameter of a first hole in a substrate element.

During a telephone conversation with Brick Power on 6/11/02 a provisional election was made without traverse to prosecute the invention of product, claims 1-5 and 18-23. Affirmation of this election must be made by applicant in replying to this

Office action. Claims 6-17 and 24-27 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

4. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in 09/916,188 on 7/26/01. It is noted, however, that applicant has not filed a certified copy of the Singapore application 200102650-9 filed on 5/8/01 as required by 35 U.S.C. 119(b).

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " INTERPOSER WITH A LATERAL RECESSED IN A SLOT TO IMPROVE WIRE BONDING OF A SEMICONDUCTOR DEVICE PACKAGE ".

Claim Objections

6. Claim 18 is objected to because of the following informalities: after the phrase "said plurality" the phrase -- of bond pads -- to better clarify applicant's invention. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
8. Claims 1-5, 20, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
9. In claim 1, the phrase "for use" is vague and indefinite since applicant is claiming a "use" in a device.
10. In claims 4 and 23, the phrases "to be" are vague and indefinite since the phrase suggest that recess can be aligned or does not have to be aligned.
11. Claims 4 and 23 recite the limitation "a semiconductor die" in lines 2 and 3, respectively. There is insufficient antecedent basis for this limitation in the claim.
12. In claim 5 and 20, the phrase "securing intermediate conductive elements" is vague and indefinite since it is not clear where the intermediate conductive elements are located.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1-4, 18, 19, and 21-23, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (U.S. 6,252,298) in view of Lo et al. (U.S. 6,242,283).

With respect to Claim 1, Lee discloses an interposer comprising a substrate element 21, 26-28 (i.e. the combination of stiffener, tape, circuit layer, and protective layer form a substrate). A slot 22 is formed through the substrate element 21, 26-28, wherein the slot 22 includes a first end above the outer periphery of a semiconductor die 31 upon assembly of the interposer with the semiconductor die 31 and a second end including a laterally recessed area (i.e. etched portion of the protective layer 27 (see col.

4 lines 23-30)) formed in only a portion thereof. One skilled in the art would readily recognized that the slot in the substrate can extend beyond an outer periphery of the semiconductor die, since different size (i.e. different forms (see col. 6 lines 56-62)) dies can be attached to the substrate without falling outside the scope of the invention because the bonding pads on the die will still electrically connected to terminals and the die will still firmly attach to the substrate by the adhesive layer (see Figs. 2, 4, and 7).

With respect to Claim 2, Lee discloses a substrate element 21, 26-28 comprised of a polyimide resin (see col. 4 lines 23-25).

With respect to Claim 3, it is inherent from Lee that laterally recessed area is configured to receive at least a tip of a wire bonding capillary.

With respect to Claim 4, Lee discloses the laterally recessed area that is positioned aligned laterally adjacent a bond pad 32 of the semiconductor die 31 upon positioning the interposer over the semiconductor die 31 so that it is located laterally over a portion of an active surface of the semiconductor die 31 located between the bond pad and an outer periphery of the semiconductor die 31 (see col. 3 lines 41-52; Fig. 2 and 4).

With respect to Claim 18, Lee discloses a semiconductor die 31 with a plurality of bond pads 32 on an active surface thereof. At least one bond pad 32 of the plurality of bond pads being located adjacent an outer periphery of the semiconductor die 31. An interposer 21, 26-28 is position over the semiconductor die 31, wherein the interposer includes at least one elongate slot 22 formed there through. The elongate slot 22 includes an end with a laterally recessed area formed in a portion thereof, wherein the

laterally recessed area upon positioning the interposer 21, 26-28 over the semiconductor die 31 while exposing the at least one bond pad and at least a portion of the active surface located between the at least one bond pad and the outer periphery of the semiconductor die 31 (see col. 3 lines 41-65; Figs. 2, 4, and 7).

With respect to Claim 19, Lee discloses the plurality of bond pads 32 of the semiconductor die 31 is arranged substantially linearly across a central region of the active region (see Figs. 4 and 7).

With respect to Claim 21, it is inherent from Lee that laterally recessed area is configured to receive at least a tip of a wire bonding capillary so as to facilitate electrical connection of the least one bond pad to a corresponding contact pad 23 on a surface of the interposer.

With respect to claim 22, Lee discloses an intermediate conductive element 33 extending between the at least one bond pad and a corresponding contact area 23 on the interposer 21, 26-28 (see Figs. 2, 4, and 7).

With respect to Claim 23, Lee discloses the interposer 21, 26-28 (see Figs. 21, 26-28). It is well known that an interposer is part of a strip comprising a plurality of physically connected interposers, each interposer of the plurality being configured to be assembled with the semiconductor die as evident by Lo et al. see Figs. 1D, 1E, and 2)

Allowable Subject Matter

15. Claims 5 and 20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all

of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach the combination of a laterally recessed area that is configured to facilitate access to the bond pad of the semiconductor die by equipment for forming, positioning, or securing intermediate conductive elements.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

16. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

AC/December 28, 2002



Alonzo Chambliss
Examiner
Art Unit 2827